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REQUEST FOR ACCESS

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DATE: 1/30/95

SERIAL NUMBER: 07/337,566

FILING DATE: 4/13/89

APPLICANTS: _____

SIR:

THE UNDERSIGNED HEREBY RESPECTFULLY REQUESTS ACCESS TO THE FILE HISTORY OF THE FOLLOWING ABANDONED APPLICATION WHICH WAS REFERRED TO IN U.S. PATENT NUMBER 5,297,148 OR PRINTED APPLICATION _____.

RESPECTFULLY SUBMITTED,

Dara Fowler

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US005297148A

United States Patent [19]

Harari et al.

[11] Patent Number: 5,297,148

[45] Date of Patent: Mar. 22, 1994

[54] FLASH EEPROM SYSTEM

[75] Inventors: Eliyahou Harari, Los Gatos; Robert D. Norman, San Jose; Sanjay Mehrotra, Milpitas, all of Calif.

[73] Assignee: SunDisk Corporation, Santa Clara, Calif.

[21] Appl. No.: 963,838

[22] Filed: Oct. 20, 1992

Related U.S. Application Data

[62] Division of Ser. No. 337,566, Apr. 13, 1989, abandoned.

[51] Int. Cl.[5] G06F 11/00

[52] U.S. Cl. 371/10.2; 371/10.1; 371/10.3; 365/200

[58] Field of Search 371/10.2, 10.1, 10.3, 371/40.1; 365/200

[56] References Cited

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4,601,031	7/1986	Walker et al.	371/10.3
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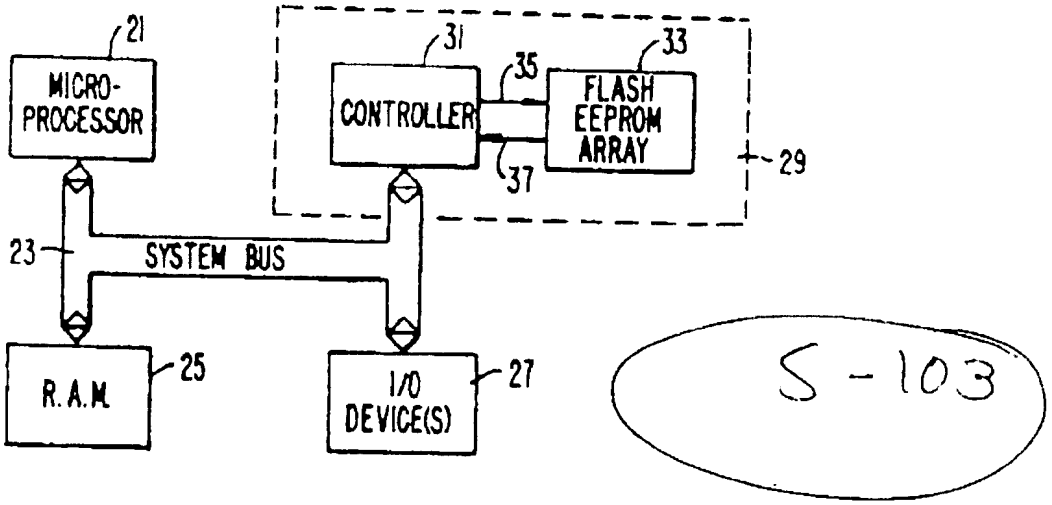
4,796,233	1/1989	Awaya et al.	371/10.2
4,920,518	4/1990	Nakamura et al.	371/10.2
4,949,309	8/1990	Rao	365/218

Primary Examiner—Robert W. Beausoliel, Jr.
Assistant Examiner—Ly V. Hua
Attorney, Agent, or Firm—Majestic, Parsons, Siebert & Hsue

[57] ABSTRACT

A system of Flash EEprom memory chips with controlling circuits serves as non-volatile memory such as that provided by magnetic disk drives. Improvements include selective multiple sector erase, in which any combinations of Flash sectors may be erased together. Selective sectors among the selected combination may also be de-selected during the erase operation. Another improvement is the ability to remap and replace defective cells with substitute cells. The remapping is performed automatically as soon as a defective cell is detected. When the number of defects in a Flash sector becomes large, the whole sector is remapped. Yet another improvement is the use of a write cache to reduce the number of writes to the Flash EEprom memory, thereby minimizing the stress to the device from undergoing too many write/erase cycling.

4 Claims, 5 Drawing Sheets



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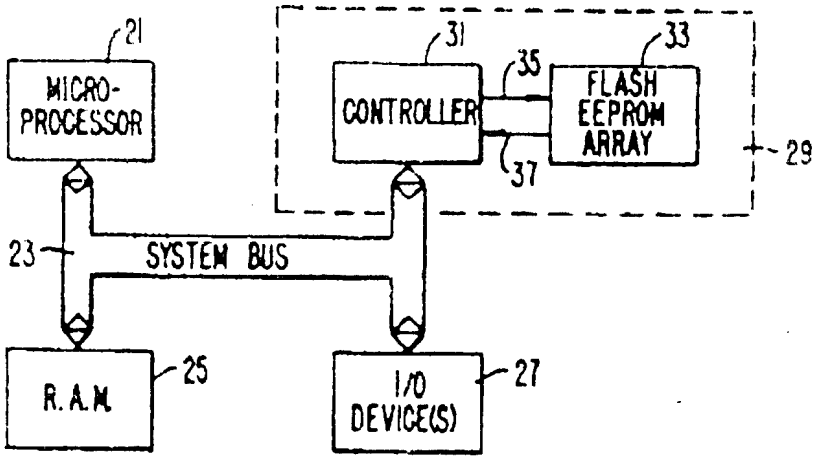
4 Claims, 5 Drawing Sheets